UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,424	07/03/2001	Ravindra K. Shetty	H00-02101 (256.099US1)	3349

128   7590   05/19/2005

HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER
ZHU, JERRY

ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/899,424	SHETTY, RAVINDRA K.
	Examiner	Art Unit	
	Jerry Zhu	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 February 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-62</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-62</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Objection

1. Claims 27, 28, 29, 30 objected to under 37 CFR 1.75 as being a substantial duplicate of claims 10,11,12,13 respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Both claim 10 and claim 27 depend on claim 9. Claims 10, 11, 12, 13 are identical to claims 27, 28, 29, 30 respectively word for word. Claims 11-13 depend on claim 10 and claims 28-30 depend on claim 27. Therefore claims 27-30 are duplicates of claims 10-13.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim1-62 rejected under 35 U.S.C. 102(b) as being anticipated by Tong, et al,

Specifically:

Claim 1

Claim 1's "a computer implemented method ... for machine learning," is anticipated by Tong et al, column 5, line 43, 44, " the method begins at 110 with a neural network..." and further anticipated in col. 8, line 53, "A method for using an artificial neural network..."

Claim 1's "receiving sparse data;" is anticipated by Tong et al, col. 8, line 65 "gathering inside data representative of said inside class;"

Claim 1's "enriching the received data..." is anticipated by Tong et al, col. 8, line 67, "generating pseudo data..."

Claim 1's "around a deviation of the mean of received data using a predetermined distribution" is anticipated by Tong et al, col. 5, line 60, "One reasonable choice for the initial pseudo data is randomly generate them within a bounding hypercube..." and line 66, "to provide an average even distribution." If data set is even distributed, then there must be a mean and a deviation from the mean for the data set.

Claim 1's "outputting the enriched data" is anticipated by Tong et al, col. 9, line 1, "inputting said inside data and said pseudo data to said artificial neural network;"

Claim 2

Claim 2's "supervised artificial neural network learning" is anticipated by Tong et al, in col. 8, line 53, "A method for using an artificial neural network..."

Claim 3 - 5

Claim 3-5 repeats claim 1 to emphasize sparse data input and therefore is anticipated by Tong et al, in the same manner as claim 1.

Claim 6 - 11

Claim 6-11 assumes that the input data belongs to multiple class sets and the neural network training operates on each class data. It is anticipated by Tong et al, col. 4, line 58, "the known data is assumed to belong to a single class although the method is applicable to multiple class data sets also."

Claim 12-14

Claim 12-14 generates and rearranges the generated additional data around deviation of mean using predetermined distribution. It is anticipated by Tong et, al, col.5, line 54, "pseudo data is generated to represent points different from the inside data," and further anticipated at col. 5, line 65, "to provide an average even distributions." Average even distribution implies that there is a mean and data deviates from the mean.

Claim 15-16

Claim 15-16's "static data and real-time data" is anticipated by Tong et, al col. 8, line 65, "gathering inside data representative of said inside class." Tong did not limit the input data to either static or real-time. It is further anticipated by Tong et, al, col. 2, line 12, "sensor-based monitoring where the task is to interpret multiple sensor outputs and determine if the monitored system is operating normally." The example is a case where the input data is real-time data.

Claim 17

Claim 17's "repeating the reading of the sample of received real-time data using a dynamically varying window of predetermined window length" is anticipated by Tong et al., col. 8, line 3, "the algorithm jumps back to block 120 to repeat the cycle." The same sample data with renewed pseudo data of the same amount is entered into the neural network at a different time frame for next iteration of training. "Repeating the reading of the sample of received real-time data using a dynamically varying window" can be explained as entering the same sample data into the neural network at a different time frame for another iteration of training. Tong et al use inside data and renewed pseudo data for different iteration of training.

Claim 18

The computer readable medium set forth in claim 18 is considered to be covered by the reference of Tong even though a computer readable medium has not been disclosed, it is considered to be inherent to neural networks that they are implemented using printed circuit boards that are computer readable. As evidence of this fact, the reference of "Appling Neural Networks," by Kevin Singler is cited. At page 186, the following passage is cited: "Neural networks have a particular advantage of being easy to implement in hardware. There are a number of neural network chips and printed circuit boards on the market." At page 6, the following passage is cited: "Neural networks are normally implemented in computer programs". Therefore the arguments for claim 1 rejection also apply to that of claim 18.

Claim 19-34

Claims 19-25, 31, and 32 depend on claim 18, either directly or indirectly. These claims contain the same limitations as are present in claims 2-17. Since the rejection of claim 18 is considered to be the same as that for claim 1, the rejection for claims 19-34 is considered to be the same as that for claims 19-34.

Claim 35

The computer system set forth in claim 35 is considered to be covered by the reference of Tong even though a computer has not been disclosed, it is

considered to be inherent to neural networks that they are implemented using a computer. As evidence of this fact, the reference of "Appling Neural Networks," by Kevin Singler is cited. At page 6, the following passage is cited: "Neural networks are normally implemented in computer programs", and at page 186, "Neural programs run on computer in the same way as any other program and modern PCs have the capacity to support modest neural network based projects". Therefore the arguments for claim 1 rejection also apply to that of claim 35.

Claim 36-44

Claims 36-44 depend on claim 35, either directly or indirectly. These claims contain the same limitations as are present in claims 19, 23-29, and 31. Claims 19, 23-29, and 31 depend on claim 18. Since the rejection of claim 18 is considered to be the same as that for claim 35, the rejection for claims 36-44 is considered to be the same as that for claims 19, 23-29, and 31 respectively.

4. Claim 45-62 rejected under 35 U.S.C. 102(b) as being anticipated by Tong, et al, Specifically:

Claim 45

The computer-implemented system set forth in claim 45 is considered to be covered by the reference of Tong even though a computer-implemented system has not been disclosed, it is considered to be inherent to neural networks that

they are implemented using a computer along with different software components. As evidence of this fact, the reference of "Appling Neural Networks," by Kevin Singler is cited. At page 6, the following passage is cited: "Neural networks are normally implemented in computer programs", and at page 186, "Neural programs run on computer in the same way as any other program and modern PCs have the capacity to support modest neural network based projects". Therefore the arguments for claim 1 rejection also apply to that of claim 45.

Claim 46

Claim 46 includes a database in the computer-implemented system of claim 45. it is considered to be inherent to that a computer implemented system uses a storage medium to store data hence the database. The arguments for claim 45's rejection also apply to that of claim 46.

Claims 47-61

Claims 47-61 depend on claim 45, either directly or indirectly. These claims contain the same limitations as are present in claims 2-13, and 15-17 respectively. Claims 2-13 and 15-17 depend on claim 1. Since the rejection of claim 1 is considered to be the same as that for claim 45, the rejection for claims 47-61 is considered to be the same as that for claims 2-13 and 15-17.

Claim 62

Claim 62's "a unique numeric transformation module coupled to the database to extract words from text stored in the database and to transform each of the extracted words into a unique numerical representation" is anticipated by Tong et, al col. 4, line 5, "a artificial network to perform classification of multi-dimensional input data when data for a class, which typically represents either an abnormal system state or a novel class of data, is either sparse or nonexistent" Tong did not limit the input data to a particular kind therefore the input data could be text data from a database.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 62 rejected under 35 U.S.C. 112, second paragraph, as no database being set forth in claim 45 therefore lack antecedent basis for this term.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 62 rejected under 35 U.S.C. 103(a) as being unpatentable over Tong et al, in

view of Thyagarajan U.S. Patent Publication # 20020124075 (Thyagarajan)

   a. Tong describes a method of neural network training in sparse input data

       environment

   b. Tong et al fail to disclose a particular data mining application

   c. Thyagarajan et al, disclose an method for data mining of receiving text data,

       extracting text data and transforming text data.

   d. It would have been obvious to one of ordinary skill in the art at the invention

       by applicant, to have used data mining application, as suggested by

       Thyagarajan, in the neural network of Tong.

Response to Arguments

Applicants remarks filed on February 28, 2005 have been reviewed by Examiner but are

found to be unpersuasive. Specifically, Applicant argues three things:

Argument 1

Applicant argues:

> Each of the independent claims describes "enriching the received data around a deviation of the mean of the received data using a predetermined distribution". Mathematically, this results in enriched data that includes additional data both on the "inside" and "outside" as those terms are used in Tong. Thus, Tong clearly lacks this element, and a proper prima facie case of anticipation has not been established. Further the claims indicate that the enriched data provides for unbiased learning. This also believed to distinguish from Tong.

Applicant clearly misunderstands and hence misinterprets Tong's terms "outside" and

"inside." "Outside" or "inside" data are data in feature space rather than data in the

space where the original sample data belongs. See abstract in Tong. In feature space,

"outside" data means pseudo data distinct from sample data classified as "inside" data.

If generated additional data points happen to be identical to sample data points, these

data points are not considered as pseudo data hence they are "inside" data. Any data

is either "inside" (sample) data or "outside" (pseudo) data and cannot be both. Hence

applicant's additional data cannot be both sample ("inside") data and pseudo ("outside")

data simultaneously. Further, data around a deviation of the mean of the received data

using predetermined distribution (generated by applicant) does not exclude randomly

generated data around sample data (generated by Tong). Therefore pseudo data

generated by Tong anticipates data generated by the applicant. Accordingly both

pseudo data generated by applicant and Tong have the same characteristics as being

either biased or unbiased. Based on this argument, it is clearly that the rejections of the

independent claims made by Examiner in the non-final rejection were proper.

Argument 2

Applicant argues:

> Applicant respectfully submits that the Examiner has not produced extrinsic evidence to show that a computer readable medium is necessarily present. The algorithm in Tong may be hardwired, or done by hand. Thus, a computer readable medium is not necessarily present, and the rejection should be withdrawn.

Applicant is silent on the evidence the examiner has provided. Neural network circuit boards introduced by Kevin are "implemented in computer programs," hence they are medium readable by computers. Kevin, cited as extrinsic evidence, teaches that "Neural network chips and printed circuit boards on the market ... are implemented in computer programs." Therefore the neural network taught by Tong is evidenced as being inherent to be computer readable medium. It is clear that the rejections of the claims 18-25, 31-34 made by Examiner in the non-final rejection were proper.

Argument 3

Applicant argues that the reference for the rejection of claim 62 is missing. The reference has been cited. Examiner does not change the position of the rejection. Further, claim 62 depends on rejected independent claim 45 hence rejected as in the claim 45. Still further, claim 45 is system claim that implements, and hence corresponds to, method claim 1. Claim 45 is further rejected in the same rationale as cited in the rejection of claim 1. It is clear that the rejection of claim 62 made by Examiner in the non-final rejection were proper.

It is clearly stated above that none of the applicant's arguments stand and that the

rejections made on the independent claims by Examiner in the non-final rejection were
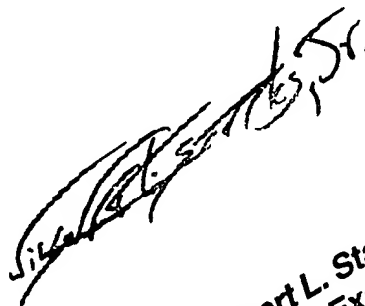
proper.

Conclusion

This Action Is Made Final. Applicant is reminded of the extension of time policy

as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed

until after the end of the THREE-MONTH shortened statutory period, then the shortened

statutory period will expire on the date the advisory action is mailed, and any extension

fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory

action. In no event, however, will the statutory period for reply expire later than SIX

MONTHS from the mailing date of this final.

Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to the examiner's supervisor, Anthony Knight whose

telephone number is (571) 272-3687.

Jerry Zhu
Examiner
Art Unit - 2129
Tuesday, May 03, 2005

Wilbert L. Starks, Jr.
Primary Examiner
Art Unit - 2121